

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Previously Presented) A semiconductor device comprising:
  - a drain electrode;
  - a source electrode;
  - a channel contacting the drain electrode and the source electrode, wherein the channel includes zinc-indium oxide having a single-phase crystalline state of  $\text{Zn}_x\text{In}_y\text{O}_{x+3y}$ , wherein x and y are each independently in the range of about 1 to about 15;
  - a gate electrode; and
  - a gate dielectric positioned between the gate electrode and the channel.
- 2 (Canceled)
3. (Currently Amended) A [[The]] semiconductor device of claim 1 comprising:  
[[,]]
  - a drain electrode;
  - a source electrode;
  - a channel contacting the drain electrode and the source electrode, wherein the channel includes zinc-indium oxide includes having a mixed-phase crystalline state formed from compounds selected from the group consisting of  $\text{ZnO}$ ,  $\text{Zn}_x\text{In}_y\text{O}_{x+3y}$ ,  $\text{In}_2\text{O}_3$ , and mixtures thereof;
  - a gate electrode; and
  - a gate dielectric positioned between the gate electrode and the channel.

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4. (Original) The semiconductor device of claim 3, wherein zinc-indium oxide includes  $\text{ZnO}:\text{Zn}_x\text{In}_{2y}\text{O}_{x+3y}:\text{In}_2\text{O}_3$  in a ratio of A:B:C, wherein A, B, and C are each in a range of about 0.025 to about 0.95.

5 (Currently Amended) A ~~[[The]]~~ semiconductor device ~~of claim 1~~ comprising:  
[[,]]  
a drain electrode;  
a source electrode;  
a channel contacting the drain electrode and the source electrode, wherein the channel includes zinc-indium oxide ~~includes~~ having an amorphous form from compounds selected from the group consisting of  $\text{ZnO}$ ,  $\text{Zn}_x\text{In}_{2y}\text{O}_{x+3y}$ ,  $\text{In}_2\text{O}_3$ , and mixtures thereof;  
a gate electrode; and  
a gate dielectric positioned between the gate electrode and the channel.

6. (Original) The semiconductor device of claim 5, wherein zinc-indium oxide includes an atomic composition of zinc and indium in a ratio of zinc(x):indium(1-x), wherein x is in the range of about 0.05 to about 0.95.

7. (Original) The semiconductor device of claim 1, wherein the channel includes being positioned between and electrically coupling the drain electrode and the source electrode.

8. (Original) The semiconductor device of claim 1, wherein at least one of the drain electrode, the source electrode, the channel, the gate electrode, and the gate dielectric is substantially transparent.

9 (Previously Presented) A semiconductor device, comprising:  
a drain electrode;  
a source electrode;

means for a channel having a single-phase crystalline state of  $\text{Zn}_x\text{In}_{2y}\text{O}_{x+3y}$ ,  
wherein x and y are each independently in the range of about 1 to about 15, to  
electrically couple the drain electrode and the source electrode;  
a gate electrode; and  
a gate dielectric positioned between the gate electrode and the channel.

10. (Canceled)

(11.) (Currently Amended) A ~~[[The]]~~ semiconductor device ~~of claim 9~~ comprising:  
[[,]]

a drain electrode;

a source electrode;

~~wherein the means for a channel includes means for forming~~ having a mixed-  
phase crystalline state from compounds selected from the group consisting of ZnO,  
 $\text{Zn}_x\text{In}_{2y}\text{O}_{x+3y}$ ,  $\text{In}_2\text{O}_3$ , and mixtures thereof;

a gate electrode; and

a gate dielectric positioned between the gate electrode and the channel.

(12.) (Currently Amended) A ~~[[The]]~~ semiconductor device ~~of claim 9~~ comprising:  
[[,]]

a drain electrode;

a source electrode;

~~wherein the means for a channel includes means for forming~~ having an  
amorphous form from compounds selected from the group consisting of ZnO,  
 $\text{Zn}_x\text{In}_{2y}\text{O}_{x+3y}$ ,  $\text{In}_2\text{O}_3$ , and mixtures thereof;

a gate electrode; and

a gate dielectric positioned between the gate electrode and the channel.

13. (Original) The semiconductor device of claim 9, wherein at least one of the drain  
electrode, the source electrode, the channel, the gate electrode, and the gate dielectric is  
substantially transparent.

14.-32. (Canceled)

- (33.) (Previously Presented) A display device, comprising:  
a plurality of pixel devices configured to operate collectively to display images,  
where each of the pixel devices includes a semiconductor device configured to control  
light emitted by the pixel device, the semiconductor device including:  
a drain electrode;  
a source electrode;  
a channel contacting the drain electrode and the source electrode,  
wherein the channel includes zinc-indium oxide having a single-phase  
crystalline state of  $Zn_xIn_{2y}O_{x+3y}$ , wherein x and y are each independently in the  
range of about 1 to about 15;  
a gate electrode; and  
a gate dielectric positioned between the gate electrode and the channel  
and configured to permit application of an electric field to the channel.

34. (Canceled)

- (35.) (Currently Amended) A [[The]] display device of claim 33 comprising: [[,]]  
a plurality of pixel devices configured to operate collectively to display images,  
where each of the pixel devices includes a semiconductor device configured to control  
light emitted by the pixel device, the semiconductor device including:  
a drain electrode;  
a source electrode;  
a channel contacting the drain electrode and the source electrode,  
wherein the channel includes zinc-indium oxide ~~includes~~ having a mixed-phase  
crystalline state formed from compounds selected from the group consisting of  
ZnO,  $Zn_xIn_{2y}O_{x+3y}$ ,  $In_2O_3$ , and mixtures thereof;  
a gate electrode; and

a gate dielectric positioned between the gate electrode and the channel  
and configured to permit application of an electric field to the channel.

36. (Original) The display device of claim 35, wherein zinc-indium oxide includes  $\text{ZnO}:\text{Zn}_x\text{In}_{2y}\text{O}_{x+3y}:\text{In}_2\text{O}_3$  in a ratio of A:B:C, wherein A, B, and C are each in a range of about 0.025 to about 0.95.

37. (Currently Amended) A [[The]] display device of claim 33 comprising: [[,]]  
a plurality of pixel devices configured to operate collectively to display images,  
where each of the pixel devices includes a semiconductor device configured to control  
light emitted by the pixel device, the semiconductor device including:

a drain electrode;

a source electrode;

a channel contacting the drain electrode and the source electrode,

wherein the channel includes zinc-indium oxide ~~includes~~ having an amorphous  
form from compounds selected from the group consisting of  $\text{ZnO}$ ,  $\text{Zn}_x\text{In}_{2y}\text{O}_{x+3y}$ ,  
 $\text{In}_2\text{O}_3$ , and mixtures thereof;

a gate electrode; and

a gate dielectric positioned between the gate electrode and the channel  
and configured to permit application of an electric field to the channel.

38. (Original) The display device of claim 37, wherein zinc-indium oxide includes an atomic composition of zinc and indium in a ratio of zinc(x):indium(1-x), wherein x is in the range of about 0.05 to about 0.95.

39. (Original) The display device of claim 33, wherein at least one of the drain electrode, the source electrode, the channel, the gate electrode, and the gate dielectric is substantially transparent.